AF

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Inamura et al.
Serial No.:	10/718,202
Conf. No.:	9823
Filed:	November 20, 2003
For:	MAGNETIC RECORDING MEDIUM FOR PERPEN-DICULAR RECORDING . . .
Art Unit:	2627
Examiner:	Miller, Brian E.

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March 21, 2007 Jan K. Folker
Date *Registration No. 37,538*
Attorney for Applicant(s)

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL

Dear Sir:

Enclosed please find the following:

(X) Appellant's Brief on Appeal Under 37 C.F.R. 41.37, including a check for $500.00.

(X) If a Petition under 37 C.F.R. 1.136(a) for an extension of time for response is required to make the attached response timely and does not separately accompany this transmittal, Applicant(s) hereby petition(s) under 37 C.F.R. 1.136(a) for an extension of time for response in the above-identified application for the period required to make the attached response timely.

(X) The Commissioner is hereby authorized to charge any additional fees which may be required to this application under 37 C.F.R. 1.16-1.17, or credit any overpayment, to Deposit Account No. 07-2069. Should no proper amount be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 07-2069. A duplicate copy of this sheet is enclosed.

Customer No. 24978
March 21, 2007
300 South Wacker Drive
Suite 2500
Chicago, Illinois 60606
Tel: (312) 360-0080
Fax: (312) 360-9315
P:\DOCS\0941\68751\BC2299.DOC

GREER, BURNS & CRAIN, LTD.

By: Jan K. Folker
James K. Folker
Registration No.: 37,538

0941-68751

PATENT APPLICATION

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March 21, 2007 — *Date*

Registration No. 37,538
Attorney for Applicant(s)

APPELLANT'S BRIEF ON APPEAL UNDER 37 C.F.R. 41.37

James K. Folker
GREER, BURNS & CRAIN, LTD.
300 South Wacker Drive
Suite 2500
Chicago, Illinois 60606
(312) 360-0080

Date: March 21, 2007

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2309.65864 PATENT APPLICATION

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Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Appeal Brief is in support of Applicant's Notice of Appeal dated January 17, 2007, from the final rejection dated July 18, 2006.

APPEAL BRIEF

(i) REAL PARTY IN INTEREST

The real party in interest in this case is Fujitsu Limited, 1-1, Kamikodanaka 4-Chome, Nakahara-ku, Kawasaki-shi, Kanagawa, 211-8588, Japan. An Assignment of the Application to the real party of interest has been recorded on Reel 014742, Frame 0034.

(ii) RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences which will directly affect, be directly affected by, or have a bearing on, the Board's decision in this pending appeal.

(iii) STATUS OF CLAIMS

This Application was originally filed with nine (9) claims, numbered as Claims 1-9, and an additional claim, Claim 10, was added during prosecution. Prior to filing the Notice of Appeal, Claims 1-4 were rejected, Claims 5-9 were allowed, and 10 was cancelled. After filing the Notice of Appeal, an amendment was filed on March 15, 2007 (which has not been acted upon, as of the filing date of this Appeal Brief) in which allowed Claims 5-9 were cancelled, without prejudice (in favor of including these claims in a Divisional Application), and Claim 1 was amended to correct a typographical error. The rejection of Claims 1-4 is herein appealed. Claim 1 is an independent claim and Claims 2-4 depend, directly or indirectly, from independent Claim 1.

(iv) STATUS OF AMENDMENTS

Amendment D, filed on March 15, 2007, after the final rejection, has not been acted upon, as of the filing date of this Appeal Brief.

(v) SUMMARY OF CLAIMED SUBJECT MATTER

The claims under appeal (Claims 1-4) are reproduced below, with bracketed insertions referring to the associated portions of the written description and drawings of the above-named application:

Claim 1. (as amended in Amendment D) A perpendicular magnetic recording medium [page 6 (line 34) through page 7 (line 8); page 15 (lines 17-23); Figures 1A, 3A, 3B (medium 10); Figure 1B (medium 20); Figures 6A, 6B (medium 116)] comprising at least a perpendicular magnetic recording layer [page 7 (lines 20-24); Figures 1A, 1B, 3A, 3B (recording layer 13)] and a backing layer [page 8 (lines 2-5); Figures 1A, 1B, 3A, 3B (backing layer 12)] backing said perpendicular magnetic recording layer, said backing layer [Figures 1A, 1B, 3A, 3B (backing layer 12)] having an in-plane magnetization [page 8 (lines 5-10); Figure 3A (arrow 33)],

characterized in that said backing layer [Figures 1A, 1B, 3A, 3B (backing layer 12)] is formed of a ferrimagnetic material having a compensation temperature in the vicinity of a recording/reproducing temperature in which reproducing of magnetic information is made from said perpendicular magnetic recording layer [page 9 (lines 21-29)],

wherein said ferrimagnetic backing layer has an easy axis in an in-plane direction [Figure 3A (arrow 33)].

Claim 2. (Original) The perpendicular magnetic recording medium as claimed in claim 1, characterized in that said recording/reproducing temperature is -20 to +100°C [page 10 (lines 10-15)].

Claim 3. (Previously Presented) The perpendicular magnetic recording medium as claimed in claim 1 or 2, characterized in that said ferrimagnetic material is any of an alloy of GdFe, an alloy of DyFe and a garnet ferrite [page 9 (lines 30-35)].

Claim 4. (Original) The perpendicular magnetic recording medium as claimed in claim 3, characterized in that said perpendicular magnetic recording layer is any of a single layer perpendicular magnetic film or a multilayer perpendicular magnetic film [page 7 (lines 28-37)].

(vi) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether Claims 1-4 are unpatentable under 35 U.S.C. §103 over United States Patent No. 5,815,342 to Akiyama et al. (hereinafter Akiyama et al.) in view of JP 02-227814 to Fukuichi (hereinafter JP '814).

(vii) ARGUMENT

I. THE REJECTION OF CLAIMS 1–4 UNDER 35 U.S.C. §103 AS BEING UNPATENTABLE OVER AKIYAMA ET AL. IN VIEW OF JP '814 SHOULD BE REVERSED

Applicants appeal the Examiner's rejection of Claims 1-4. As discussed below, the §103 rejection of Claims 1-4 over Akiyama et al. in view of JP '814 is improper because: (A) One of ordinary skill in the art would not have modified the back layer of Akiyama et al. in light of the ferrimagnetism layer of JP '814 because the relevant layer of Akiyama et al. has in-plane magnetism while the relevant layer of JP '814 has perpendicular magnetism; and (B) assuming *arguendo* that one would have modified the back layer of Akiyama et al. to include the compensation temperature feature of the ferrimagnetic layer JP '814, one would have also included the perpendicular magnetization feature of the ferromagnetic layer.

A. One of Ordinary Skill In The Art Would Not Have Modified The Back Layer Of Akiyama Et Al. In Light Of The Ferrimagnetism Layer of JP '814 Because The Relevant Layer Of Akiyama Et Al. Has In-Plane Magnetization While The Relevant Layer Of JP '814 Has Perpendicular Magnetization.

As correctly acknowledged by the Examiner, the Akiyama et al. reference fails to disclose all of the features of the magnetic recording medium defined in independent Claim 1. More specifically, the Examiner correctly acknowledged that the Akiyama et al. reference fails to disclose that the ferrimagnetic material of the backing layer "has a compensation temperature in the vicinity of a recording/reproducing temperature in which

reproducing is made from said perpendicular magnetic recording layer," as recited in independent Claim 1. *See* July 18, 2006 Final Office Action, page 2 (paragraph 4, line 7) through page 3, line 4). Accordingly, the Examiner relied upon JP '814 for this feature.

However, as explained below, Applicants respectfully submit that one of ordinary skill in the art would not have modified the back layer of Akiyama et al. in light of the ferrimagnetism layer of JP '814 because the back layer of Akiyama et al. has in-plane magnetization, while the ferrimagnetic layer of JP '814 has perpendicular magnetization. The Akiyama et al. reference discloses the use of a back layer 22 with in-plane magnetization, as represented by arrow H of Figure 2. *See e.g.*, Akiyama et al., col. 7, lines 7-10. The Akiyama et al. reference discloses that the use of such in-plane magnetization for a back layer 22, in combination with a recording layer 23 of perpendicular magnetization, suppresses the generation of Barkhausen noise because shifting of the magnetic domain wall in layer 22 is suppressed. *See e.g.*, Akiyama et al., col. 3, lines 52-64; col. 7, lines 46-59. Thus, the in-plane magnetization of the back layer is an important aspect of the medium of Akiyama et al.

In contrast, in JP '814, the layer below the magnetization layer 3, layer 2 (which is the layer that most closely resembles the back layer of Akiyama et al.) has perpendicular magnetization. *See* JP '814, English Language Constitution, lines 7-9. After describing the use of a perpendicularly-magnetized back layer 2 of a particular compensation temperature in combination with a perpendicularly-magnetized recording layer 3, the last four lines of the English Language Constitution of JP '814 state that this particular configuration improves the

perpendicular magnetic anisotropy and allows for high density recording. Thus, the use of a lower layer with perpendicular magnetization is clearly an important feature of JP '814. Further, JP '814 fails to teach anything regarding the interaction between a back layer with in-plane magnetization and a recording layer with perpendicular magnetization. Accordingly, since JP '814 only teaches the benefits of the interaction between two layers that both have the same type of magnetization (perpendicular magnetization), one of ordinary skill in the art would not have been motivated to modify the back layer 22 of Akiyama et al., which has in-plane magnetization, and which is used in combination with a recording layer 3 that has a different type of magnetization (perpendicular magnetization) to include the compensation temperature feature of JP '814. Thus, for at least this reason, Applicants respectfully assert that this §103 rejection cannot be maintained.

B. Assuming *Arguendo* That One Would Have Modified The Back Layer Of Akiyama Et Al. To Include The Compensation Temperature Of JP '814, They Would Have Also Included The Perpendicular Magnetization Structure Of JP '814.

Assuming *arguendo* that one of ordinary skill in the art would have been motivated to modify the back layer 22 of Akiyama et al. in light of ferrimagnetism layer 2 of JP '814 to include the compensation temperature feature, they would have also included the perpendicular magnetization structure of layer 2 of JP '814 into layer 22 of Akiyama et al. As mentioned in Section I. A. above, JP '814 teaches that the benefits of improved magnetic anisotropy and increased recording density are achieved by the interaction between the

perpendicularly-magnetized ferrimagnetic layer 2, with a particular compensation temperature, and the perpendicularly-magnetized recording layer 3. As also mentioned above, JP '814 does not teach anything about the use of ferrimagnetic layer with in–plane magnetization. Thus, the interaction between the two perpendicularly-magnetized layers of JP '814 is important. Accordingly, assuming *arguendo* that one would have modified back layer 22 of Akiyama et al. in light of JP '814, they would have also made layer 22 have perpendicular magnetization, as taught in JP '814. However, Claim 1 of the present application specifically recites that the backing layer has "in-plane magnetization." Accordingly, such a combination would not satisfy Claim 1. Thus, for this reason also, Applicants respectfully assert that this §103 rejection of independent Claim 1 and associated dependent Claims 2-4 cannot be maintained.

The Examiner has asserted that the proposed combination of JP '814 and Akiyama et al. maintains the in-plane magnetization feature of back layer 22 of Akiyama et al., and only includes the compensation temperature feature of JP '814, without the perpendicular magnetization feature found in the very same layer. *See* July 18, 2006 Final Office Action, page 4 (last four lines). However, such selective use of one feature of a component, without using another related feature *from the very same component* is a clear example of the use of impermissible hindsight where the Examiner is picking and choosing among various features of the prior art, without considering the reference as a whole, to arrive at the claimed invention.

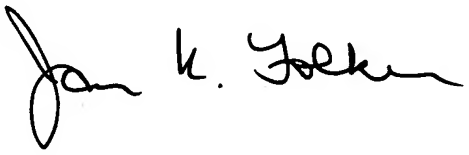
Further support that the Examiner is using impermissible hindsight by picking and choosing among various features without considering the references as a whole can be found by considering that both Akiyama et al. and JP '814 teach the benefits of the magnetic interactions between two layers. In particular, Akiyama et al. teaches that the magnetic interaction between back layer 22, which has in-plane magnetization, and recording layer 23, which has perpendicular magnetization, suppresses the generation of Barkhausen noise because shifting of the magnetic domain wall in layer 22 is suppressed. *See e.g.*, Akiyama et al., col. 3, lines 52-64; col. 7, lines 46-59. On the other hand, the benefits of JP '814, improved anisotropy and higher density recording, are achieved by the magnetic interaction between two layers (ferrimagnetic layer 2 and recording layer 3) both having perpendicular magnetization. *See* JP '814, English Language Constitution. Thus, the Akiyama et al. reference relies on the magnetic interaction between two layers that are magnetized in different directions (in-plane and perpendicular), while JP '814 relies on the magnetic interaction between two layers that are magnetized in the same direction (both perpendicular). Since JP '814 teaches that its benefits are achieved using magnetic interaction between two layers that are both magnetized in the perpendicular direction, where one layer also includes a particular compensation temperature, only a proposed combination using impermissible hindsight would limit the modification of Akiyama et al. to adding the compensation temperature feature of the ferrimagnetic layer, without also including the perpendicular magnetization direction *of this very same layer*. However, Claim 1 of the present application specifically recites that the backing layer has "in-plane magnetization."

Accordingly, if back layer 22 of Akiyama et al. were made with perpendicular magnetization, such a combination would not satisfy Claim 1. Thus, for this reason also, Applicants respectfully assert that this §103 rejection of independent Claim 1 and associated dependent Claims 2-4 cannot be maintained.

For all of the above reasons, Applicants respectfully request that the Board reverse the §103 rejection of Claims 1-4 under Akiyama et al. in view of JP '814

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By 

James K. Folker
Registration No. 37,538

Customer No. 24978

March 21, 2007
300 South Wacker Drive, Suite 2500
Chicago, Illinois 60606
Telephone: (312) 360-0080
Facsimile: (312) 360-9315
P:\DOCS\0941\68751\BB4649.DOC

(viii) CLAIMS APPENDIX

The following claims are shown as amended by Amendment D, filed March 15, 2007. As of the filing date of this Brief, Amendment D had not been acted upon.

1. A perpendicular magnetic recording medium comprising at least a perpendicular magnetic recording layer and a backing layer backing said perpendicular magnetic recording layer, said backing layer having an in-plane magnetization,

characterized in that said backing layer is formed of a ferrimagnetic material having a compensation temperature in the vicinity of a recording/reproducing temperature in which reproducing of magnetic information is made from said perpendicular magnetic recording layer,

wherein said ferrimagnetic backing layer has an easy axis in an in-plane direction.

2. The perpendicular magnetic recording medium as claimed in claim 1, characterized in that said recording/reproducing temperature is -20 to +100°C.

3. The perpendicular magnetic recording medium as claimed in claim 1 or 2, characterized in that said ferrimagnetic material is any of an alloy of GdFe, an alloy of DyFe and a garnet ferrite.

4. The perpendicular magnetic recording medium as claimed in claim 3, characterized in that said perpendicular magnetic recording layer is any of a single layer perpendicular magnetic film or a multilayer perpendicular magnetic film.

5.-10. (Cancelled)

(ix) EVIDENCE APPENDIX

No evidence is submitted by Appellants pursuant to 37 C.F.R. §§1.130, 1.131 or 1.132, or entered by the Examiner and relied upon by Appellants in this appeal.

(x) RELATED PROCEEDINGS APPENDIX

There are no related decisions rendered by a court or the Board in any proceeding pursuant to 37 C.F.R. §41.37(c)(1)(ii).